

Hummingbird flowers of British Columbia

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Abstract

Aquilegia formosa, *Castilleja hispida*, *C. miniata*, *C. rhexifolia*, *C. rupicola*, *Gilia aggregata*, *Lonicera ciliosa*, *Ribes lobbii*, and *Stachys cooleyae* are the plant species in British Columbia which best fit the syndrome of hummingbird pollination. *Impatiens capensis*, *I. noli-tangere*, *Lilium columbianum*, *Lonicera dioica*, *Monarda fistulosa*, *Ribes sanguineum*, and *Rubus spectabilis* have mixed or transitional pollination strategies, being pollinated by both insects and hummingbirds. Examples of opportunistic nectar foraging by hummingbirds are recorded for several other species.

Introduction

Hummingbird flowers are defined by Grant and Grant (1968) as flowers adapted primarily for feeding of and pollination by hummingbirds. The syndrome of hummingbird pollination in western North America includes several coadaptations. Well-developed hummingbird flowers are usually solitary or loosely clustered, and are borne in a pendent or more or less horizontal position. They frequently have deep-tubular corollas or are otherwise constructed to restrict access to the very abundant nectar. The flowers are usually odourless, and most often coloured a vivid red or orange, or red combined with yellow. Correspondingly, hummingbirds hover while sipping nectar. They have long bills and long, extensible tongues. Hummingbirds have high energetic requirements (Heinrich and Raven, 1972). They do not respond primarily to floral odours, but they do perceive red and orange and recognize

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red flowers as signals of a high caloric reward. The common colour of hummingbird flowers facilitates quick pollinator recognition but is not conspicuous to insects (except butterflies) that could deplete the nectar supply (Grant, 1966; Faegri and van de Pijl, 1971; Raven 1972).

The nectar and sexual organs of typical hummingbird flowers are separated in such a way that pollen is usually deposited on the feathered parts of the bird. Depending on the morphology of the flower and the feeding orientation of the hummingbird, pollen may collect on the back or top of the head, the upper or lower bill base, the chin, or the throat. In flowers with short tubes and included sexual organs, pollen may be transferred via the bill tips of hummingbirds. Studies of hummingbird dispersal of pollen labelled with radioactive iodine indicate that hummingbirds are extremely efficient vectors, at least within local populations (Schlising and Turpin, 1971).

Feeding on small insects and floral nectar, hummingbirds migrate northward to their breeding ranges in early spring as the flowering season commences, and return southward to their wintering ranges in late summer and early fall. Rufous hummingbirds (*Selasphorus rufus*) are the commonest visitors, abundant throughout all but far northeastern British Columbia. Calliope hummingbirds (*Stellula calliope*) are common summer residents from the southern Interior to the Vanderhoof area (Munro and Cowan, 1947). The black-chinned hummingbird (*Archilocus alexandri*) is a scarce summer visitant to extreme southern Interior British Columbia (Munro and Cowan, 1947). In the Victoria area there have been sight records of the anna (*Calypte anna*) and costa (*Calypte costa*) hummingbirds (Godfrey, 1966; Mackenzie-Grieve and Tatum, 1974).¹

The following plant species occur in British Columbia and conform in most features to the syndrome of hummingbird pollination: *Aquilegia formosa* Fisch., *Castilleja hispida* Benth., *C. miniata* Dougl. (includes *C. hetetophila* Pennell), *C. rhexifolia* Rydb., *C. rupicola* Piper, *Gilia aggregata* (Pursh) Spreng. (var. *aggregata*), *Lonicera ciliosa* (Pursh) DC., *Ribes lobbii* Gray, *Stachys cooleyae* Heller.

1. Editor's note: Annas is now also known to nest in the Vancouver area. See www.naturalhistory.bc.ca/VNHS/Birding/Checklists/VancouverChecklist.pdf

All of these species except *Ribes lobbii* were included by Grant and Grant (1968) as definite hummingbird flowers. These authors also listed *Castilleja suksdorfii* as a British Columbia hummingbird flower, but this species does not occur in the Province (Hitchcock and Cronquist, 1973; Taylor, 1974).

Ribes lobbii, a species of southwestern British Columbia south to California, has pendant flowers with sharply reflexed, bright red calyx lobes, a narrowly campanulate hypanthium, and well-exserted stamens and styles. The adnate portion of the calyx and the anthers is also reddish. Superficially, the flowers resemble miniature *Fuchsia*. The floral mechanism appears similar to, but not as specialized as, that described by Grant and Grant (1968) for *Ribes speciosum*, the *Fuchsia*-flowered gooseberry of central southern California.

Several other species have floral mechanisms that diverge from the syndrome of entomophily, and approach but do not attain the typical condition of hummingbird flowers. It seems reasonable to view these transitional mechanisms as mixed strategies for pollination, optimal under present conditions.

***Impatiens capensis* Meerb. and *I. noli-tangere* L.**

These closely related species of moist woods and thickets have yellow to orange flowers that are often spotted or mottled with crimson or reddish brown. The flowers are 2-3 cm long and have recurved, nectariferous spurs. James (1948) noted that *I. capensis* (as its synonym, *I. biflora*) was one of the summer flowers most commonly visited by hummingbirds in the eastern United States. Knuth (1908) observed visits by *Bombus* spp., vespid wasps, and halictid bees to *I. noli-tangere* in Europe. In British Columbia, I have observed both hummingbirds and bumblebees at the flowers of these jewelweeds.

***Lilium columbianum* Hanson**

The tiger lily's pendant flowers have six strongly recurved sepals that are yellow-orange to reddish-orange, spotted with deep red or purple. Both style and stamens are well exerted. Nectar is secreted between the base of the ovary and the tepals. The tepals lack the nectar slits

described in other similar *Lilium* species by Knuth (1909) and Proctor and Yeo (1973). In British Columbia, hummingbirds and various Lepidoptera are common visitors to the flowers of *L. columbianum*. In California, two species of *Lilium* have evolved to specialized hummingbird pollination, whereas another species (*L. humboldtii*) is similar to *L. columbianum* in being visited by both butterflies and hummingbirds (Grant and Grant, 1968).

***Lonicera dioica* L. var. *glaucescens* (Rydb.) Butters**

This taxon occurs in the far southeastern and northeastern regions of the Province. Its flowers are similar to those of *Lonicera ciliosa*, but the corolla is more strongly bilabiate, yellowish to purplish or reddish rather than orange-red, and the corolla tube is shorter (up to 3 cm x 2.5-4 cm). I have seen ruby-throated hummingbirds visiting *L. dioica* in Minnesota, and it is probably also frequently pollinated by bees and butterflies.

A shift to hummingbird pollination can also be seen in *Lonicera involucrata* (Rich.) Banks var. *ledebourii* (Each.) Jeps., a variety of the southern Oregon and northern California coasts. It has reddish-tinged corollas up to 2 cm long instead of the typical yellow 1- 1.5 cm long corollas. The bright-red involucre bracts are additional attractive features. Grant and Grant (1968) include it as a hummingbird flower, whereas typical *L. involucrata* is pollinated in British Columbia primarily by bumblebees, butterflies, and moths, and only occasionally by hummingbirds.

***Monarda fistulosa* L.**

This taxon is listed by Grant and Grant (1968) as a definite hummingbird flower, but in British Columbia it is visited by butterflies and bumblebees as well. The 2.5-3.5 cm long, lavender-purple flowers are borne more or less horizontally in dense, terminal heads. The related Oswego tea, *Monarda didyma*, familiar to gardeners, has longer, crimson corollas and is a better developed hummingbird flower (see James, 1948).

***Ribes sanguineum* Pursh**

The flowering of this beautiful currant usually heralds the spring arrival of the first migrating rufous hummingbirds along British Columbia's southern coast. The pale rose to crimson flowers are clustered in hanging racemes. Each flower has a tubular-campanulate hypanthium 3-5 mm long surmounted by spreading calyx lobes of about the same length. The five petals and stamens are slightly shorter than the sepals and are borne near the top of the hypanthium in a loose ring. The styles are about as long as the sepals and are slightly exerted from the rest of the flower. The short total length of the flower (no more than 10 cm from stigmas to hypanthium base) and the positioning of the sexual organs probably result in bill tip or bill base pollen transfer by hummingbirds. The flowers have abundant nectar but only a faint spicy-sweet fragrance (a strong odour of wild currant is general to the plant). I have observed both hummingbirds and bumblebees nectar-feeding on *Ribes sanguineum*. Rufous hummingbird visits have also been observed in British Columbia by Pillsbury (1950). The red flowering currant is a highly prized ornamental shrub in many other countries, and it is noteworthy that Proctor and Yeo (1973) mention titmice (*Parus*) thieving nectar from cultivated *R. sanguineum* in Britain.

***Rubus spectabilis* Pursh**

Salmonberry flowers are another good example of a partial shift toward hummingbird pollination in a genus that is predominantly entomophilous. Like *Ribes sanguineum*, its flowering is correlated with the arrival of migrating rufous hummingbirds along the Pacific coast from northwestern California to southwestern Alaska. The showy, red to reddish-purple petals are up to 30 mm long and form a shallow, downturned bell. The numerous stamens arch up over the receptacle to form a cone; they do not lie flat against the petals as in most species of *Rubus*. The flowers are copiously nectariferous between the receptacle and the filaments, but only mildly sweet-smelling. Again, as with *Ribes sanguineum*, I have observed both hummingbird and bumblebee visits to salmonberry flowers. Meeuse (1972), in a review of Faegri and van der Pijl's 1971 text, remarks that "...the flowers of *Rubus spectabilis*, cer-

tainly among the showiest of all Rubi, are very rich in nectar indeed. In this plant...color and the possession of much nectar, simply form part of a whole complex of characters that appear to stimulate hummingbird pollination."

Hummingbirds are notorious for their weakly selective, opportunistic choice of a wide variety of nectar sources. It is not surprising that in British Columbia, with a flora poor in specialized hummingbird flowers, the birds can be seen taking nectar from many different primarily entomophilous species. Some flowers which I have seen hummingbirds visit in British Columbia include the primarily bombophilous *Castilleja unalaschensis*, *Mimulus lewisii*, and *Pedicularis bracteosa* [also observed on Mount Rainier by Macior (1973)]; the abundantly nectariferous but relatively small-flowered, ericaceous *Arbutus menziesii*, *Arctostaphylos columbiana*, and *Gaultheria shallon*; as well as the entomophilous species *Delphinium nuttallianum*, *Epilobium angustifolium*, *Lythrum salicaria*, and *Osmaronia cerasiformis*. Calliope hummingbirds have been observed taking nectar from the catkins of a species of *Salix*, and from the flowers of *Arctostaphylos uva-ursi* in the Jesmond area (Cariboo District) in May 1974 (R.A. Pojar, pers. comm.). In visiting *A. uva-ursi*, the hummingbirds alighted momentarily to probe the low flowers while flying from plant to plant. Many entomophilous cultivated plants such as *Aesculus hippocastanum*, *A. ×carneum*, *Buddleja davidii*, and species of *Aconitum*, *Delphinium*, *Pelargonium* and *Rhododendron*, among others, are also frequently visited. This feeding promiscuity extends even to sap-filled flicker holes in the trunks of *Betula papyrifera*. Undoubtedly, careful observation will discover more examples of unusual hummingbird behaviour.

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